UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/782,151	02/14/2001	Ralph E. Frazier	8605	2317

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ART UNIT	PAPER NUMBER
2192	

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 November 2004*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1.   Applicant's amendment and response filed on November 15, 2004 has been fully

considered. Claims 1-20 are pending.

Response to Arguments

2.   Applicant's arguments have been fully considered but they are not persuasive.

3.   Applicant contends that the information provided by Bishop does not include a history of

operating software events with information relating to the history being organized and stored as

operating software program scheduling information relating to interactions between the operating

system software and each of the programs and tasks managed by the operating system software

(Applicant's remarks, page 7, last paragraph to page 8, first paragraph).

However, as set forth in the previous Office action, Barritz teaches these features, rather

than expressly Bishop. Barritz discloses monitoring events as they occur and recording an event

history log (see, for example, FIG. 5 and column 6, lines 54-57), in which the recorded

information comprises job scheduling information for each module or task managed by the

scheduler, i.e. the operating system software (see, for example, column 6, lines 58-64).

4.   Applicant contends that Bishop does not employ indications of relative priorities and

tasks (Applicant's remarks, page 8, second paragraph).

However, as set forth in the previous Office action, Farrell teaches these features, rather

than expressly Bishop. Farrell discloses scheduling information that indicates the relative

priorities of threads or tasks (see, for example, thread state descriptor 19 in FIG. 2, and column 4,

line 62 to column 5, line 12).

5.   Applicant contends that the information collected by Barritz does not include information

relating to relative priorities of programs and tasks, transfers of control from lower priority to

higher priority tasks, and tasks waiting for execution at the occurrence of each operating

software event (Applicant's remarks, page 9, first paragraph).

However, as set forth in the previous Office action, Farrell, Bishop and Yamagishi teach

these features, rather than expressly Barritz. Farrell discloses scheduling information that

indicates the relative priorities of threads or tasks (see, for example, thread state descriptor 19 in

FIG. 2, and column 4, line 62 to column 5, line 12), as noted above. Bishop discloses scheduling

information that includes indications of transfers of control from lower priority to higher priority

tasks (see, for example, FIG. 13A, which shows trace records for process switches, i.e. transfers

of control among tasks, and column 10, lines 62-67, which shows that the tasks have lower and

higher priority levels). And finally, Yamagishi discloses scheduling information that identifies

the number of jobs or tasks waiting for execution (see, for example, operation status table 9 and

heading 92 in FIG. 3).

6.   Applicant contends that Farrell does not teach the relatively•long term storage of

scheduling information to permit review by a user (Applicant's remarks, page 9, second

paragraph). Similarly, Applicant contends that Yamagishi does not collect data identifying the

tasks awaiting execution at each particular software event for relatively long duration storage in

order to permit review by a user (Applicant's remarks, page 10, first paragraph).

However, as set forth below, Bishop teaches the new limitation wherein the operating

software scheduling information is recorded "for relatively long duration storage in order to

permit review of the scheduling information by a user," rather than expressly Farrell or

Yamagishi. Bishop discloses that the data is recorded for a period of time, such as 600 seconds,

to permit review of past records by a user (see, for example, column 22, lines 18-22). A duration

of 600 seconds, or 10 minutes, may be relatively short compared to a duration of one year, but it

is relatively long compared to a duration of one microsecond. Therefore, the period of time

disclosed by Bishop may be considered a "relatively long duration."

Claim Rejections - 35 USC § 112

7.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

8.   Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for

failing to particularly point out and distinctly claim the subject matter which Applicant regards as

the invention.

The term "relatively long duration" in claims 1, 15 and 18 is a relative term that renders

the claim indefinite. The term "relatively long duration" is not defined by the claim, the

specification does not provide a standard for ascertaining the requisite degree, and one of

ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claims 2-14, 16-17 and 19-20 are dependent upon claims 1, 15 and 18, respectively, and

are therefore indefinite for the same reason.

Claim Rejections - 35 USC § 103

9.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10.   Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 6,049,798 to Bishop et al. (art of record, "Bishop"), in view of U.S. Pat. No. 5,590,056 to Barritz (art of record, "Barritz"), in view of U.S. Pat. No. 5,247,675 to Farrell et al. (art of record, "Farrell"), and in view of U.S. Pat. No. 5,870,604 to Yamagishi (art of record, "Yamagishi").

With respect to claim 1 (currently amended), Bishop discloses a method of capturing operating software scheduling information during execution of operating software (see, for example, the abstract, which shows capturing internal resource information such as CPU and memory availability or utilization, i.e. scheduling information, in real-time, i.e. during execution of the operating software), the method comprising the steps of:

(a) compiling operating software scheduling information capture software as part of the operating system (see, for example, column 11, lines 1-4, which shows a service of the operating system, inherently compiled, that is used for capturing event traces of process activity, i.e. scheduling information).

Although Bishop discloses recording the data for a certain amount of time in order to provide past records, i.e. a history of events (see, for example, column 22, lines 18-22), and discloses identifying each task by process ID and process name (see, for example, FIG. 13A), Bishop does not expressly disclose the limitation wherein the operating software scheduling information capture software is operative to record a history of the operating software events as they occur, information related to the history being organized and stored as operating software

program scheduling information relating to interactions between the operating system software

and each of the programs and tasks managed by the operating system software.

However, Barritz discloses monitoring events as they occur and recording an event

history log (see, for example, FIG. 5 and column 6, lines 54-57), in which the recorded

information comprises job scheduling information for each module or task managed by the

scheduler, i.e. the operating system software (see, for example, column 6, lines 58-64), so as to

identify software usage patterns (see, for example, column 2, line 63 to column 3, line 4).

It would have been obvious to one of ordinary skill in the art at the time the invention

was made to supplement the capture system of Bishop with the event history features taught by

Barritz, for the purpose of identifying software usage patterns.

Although Bishop discloses monitoring and capturing the information to improve the

efficiency of a computer system (see, for example, column 3, lines 12-33), Bishop does not

expressly disclose the limitation wherein the scheduling information includes indications of

relative priorities of programs and tasks.

However, Farrell discloses scheduling information that indicates the relative priorities of

threads or tasks (see, for example, thread state descriptor 19 in FIG. 2, and column 4, line 62 to

column 5, line 12), which is used to optimize program execution (see, for example, column 2,

lines 19-24).

It would have been obvious to one of ordinary skill in the art at the time the invention

was made to supplement the information captured by Bishop with the relative priorities of

programs and tasks, such as taught by Farrell, in order to further improve execution efficiency.

Bishop further discloses the limitation wherein the scheduling information includes

indications of transfers of control from lower priority to higher priority tasks (see, for example,

FIG. 13A, which shows trace records for process switches, i.e. transfers of control among tasks,

and column 10, lines 62-67, which shows that the tasks have lower and higher priority levels).

Although Bishop discloses monitoring and capturing the information to improve the

efficiency of a computer system (see, for example, column 3, lines 12-33), Bishop does not

expressly disclose the limitation wherein the scheduling information includes identification of

tasks waiting for execution at the occurrence of each software event.

However, Yamagishi discloses scheduling information that identifies the number of jobs

or tasks waiting for execution (see, for example, operation status table 9 and heading 92 in FIG.

3). A CPU monitor captures the information from a job scheduler (see, for example, column 3,

lines 59-65) to distribute the load among processors, thereby improving efficiency (see, for

example, column 2, lines 36-39).

It would have been obvious to one of ordinary skill in the art at the time the invention

was made to supplement the information captured by Bishop with the tasks waiting for

execution, such as taught by Yamagishi, in order to further improve execution efficiency.

Bishop further discloses the steps of:

(b) invoking operating software scheduling information capture (see, for example,

column 20, line 55 to column 21, line 4, which shows a procedure for invoking the capture of the

data); and

(c) recording operating software scheduling information for relatively long duration

storage in order to permit review of the scheduling information by a user (see, for example,

column 22, lines 18-22, which shows recording the data for a relatively long duration for review

of past records by a user).

With respect to claim 2 (original), Bishop further discloses the limitation wherein the

operating software scheduling information capture procedure is invoked on an operating

software task switch (see, for example, column 14, lines 14-15 and line 55 to column 15, line 11,

which shows that mode switches and thread dispatches, i.e. task switches, can invoke the capture

of scheduling information).

With respect to claim 3 (original), Bishop further discloses the limitation wherein the

operating software scheduling information recorded includes information updated or maintained

by the operating software in relation to the scheduling of a program (see, for example, FIG. 13A,

which shows trace records that include execution time and interrupt time, information

maintained by the operating system in relation to scheduling).

With respect to claim 4 (original), Bishop in view of Barritz, Farrell and Yamagishi

further discloses the limitation wherein the operating software scheduling information recorded

includes task identification, task priority, and task run-time length (see, for example, Bishop,

FIG. 13A, which shows trace records that include the process ID, i.e. task identification, and the

execution time, i.e. run-time length; also see, for example, Farrell, FIG. 2, which shows a thread

state descriptor that includes the thread or task priority).

With respect to claim 5 (original), Bishop in view of Barritz, Farrell and Yamagishi

further discloses the limitation wherein the operating software scheduling information includes a

task waiting count (see, for example, Yamagishi, FIG. 3, which shows an operation status table that includes the number of jobs waiting for execution, i.e. a task waiting count).

With respect to claim 6 (original), Bishop further discloses the limitation wherein the operating software scheduling information is recorded to a ledger (see, for example, column 20, lines 36-37 and 50-52, which shows that the data is initially recorded to a buffer or ledger).

With respect to claim 7 (original), Bishop further discloses the limitation wherein the ledger is at least one of a circular or fixed length ledger (see, for example, column 21, lines 23-26, which shows that data is discarded from the pipe if it is not read quickly enough, i.e. because the buffer is a circular ledger having a fixed length).

With respect to claim 8 (original), Bishop further discloses the limitation wherein the scheduling information includes at least one of the number of program schedules, program preempts, and interrupts (see, for example, column 14, lines 14-15 and 35-45, which shows that interrupts are recorded).

With respect to claim 9 (original), Bishop further discloses the limitation wherein the scheduling information includes at least one of the highest priority attained, program identity, and length of run-time (see, for example, column 21, lines 49-52, which shows that the process name, i.e. the program identity, is included in the captured scheduling information).

With respect to claim 10 (original), Bishop further discloses the limitation wherein the scheduling information includes at least one of the lowest priority attained, program identity, and

length of run-time (see, for example, column 21, lines 49-52, which shows that the process name, i.e. the program identity, is included in the captured scheduling information).

With respect to claim 11 (original), Bishop further discloses the limitation wherein the scheduling information includes at least one of the number of times in the idle loop and length of run-time (see, for example, FIG. 13A, which shows trace records that include the execution time, i.e. the length of run-time).

With respect to claim 12 (original), Bishop further discloses the limitation wherein the scheduling information includes a sequential record of at least one of scheduled programs, priorities, and events (see, for example, column 15, lines 54-64, which shows that events are matched with timing information to compose a sequential record of events).

With respect to claim 13 (original), Bishop in view of Barritz, Farrell and Yamagishi further discloses the limitation wherein the scheduling information includes at least one of the number and identity of programs waiting to run (see, for example, Yamagishi, FIG. 3, which shows an operation status table that includes the number of jobs waiting to run).

With respect to claim 14 (original), Bishop further discloses the limitation wherein the operating software scheduling information capture is invoked on an event occurrence (see, for example, column 14, lines 14-15 and 55-60, which shows that events such as a mode switch can invoke the capture of scheduling information).

With respect to claim 15 (currently amended), the limitations recited in the claim are analogous to those of claim 1 (see the rejection of claim 1 above).

With respect to claim 16 (original), Bishop further discloses the limitation wherein said

operating software scheduling information capture software is not resident on an external device

(see, for example, column 4, lines 32-34, which shows that the software can be internal to the

system, and column 22, lines 59-63, which shows that external hardware is not needed).

With respect to claim 17 (original), Bishop further discloses the limitation wherein said

operating software scheduling information capture software is not a separate task scheduled by

an operating software scheduler (see, for example, column 11, lines 1-10 and 30-35, which

shows that the information capture is performed by a device driver, i.e. not by a separate task

scheduled by a operating software scheduler).

With respect to claim 18 (currently amended), the limitations recited in the claim are

analogous to those of claim 1 (see the rejection of claim 1 above). Bishop further discloses a

processor for receiving and transmitting data (see, for example, CPU 190 in FIG. 14) and a

memory coupled to the processor (see, for example, RAM 194 in FIG. 14), the memory storing

instructions to be executed by the processor.

With respect to claim 19 (original), Bishop further discloses the limitation wherein said

operating system scheduling information capture software is internally processed on said

processor (see, for example, column 4, lines 32-34, which shows that the software can be internal

to the system).

With respect to claim 20 (original), Bishop further discloses the limitation wherein said

operating software scheduling information capture software is not a separate task scheduled by

an operating software scheduler (see, for example, column 11, lines 1-10 and 30-35, which

shows that the information capture is performed by a device driver, i.e. not by a separate task

scheduled by a operating software scheduler).

Conclusion

11.   Applicant's amendment necessitated the new ground(s) of rejection presented in this

Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this

final action.

12.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Michael J. Yigdall whose telephone number is (571) 272-3707.

The examiner can normally be reached on Monday through Friday from 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Tuan Q. Dam can be reached on (571) 272-3695. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MY   Michael J. Yigdall
                        Examiner
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